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# State of Utah

## DEPARTMENT OF NATURAL RESOURCES

MICHAEL R. STYLER  
Executive Director

### Division of Oil, Gas and Mining

JOHN R. BAZA  
Division Director

March 6, 2012

Rick Havenstrite  
Desert Hawk Gold Corporation  
1290 Holcomb Ave.  
Reno, Nevada 89502

Subject: Review 3A—Deleterious Materials Characterization and Related Permit Information, Desert Hawk Gold Corporation, Kiewit Project Mine, M/045/0078, Tooele County, Utah

Dear Mr. Havenstrite:

The Division of Oil, Gas and Mining has completed a review of the deleterious materials characterization and related information from the Notice of Intention to Commence Large Mining Operations for the Kiewit Project Mine.

The comments are listed under the applicable Minerals Rule heading. In reply, please address the comments using redline and strikeout text as far as possible, and please include form MR-REV available on the Division's web site. After the notice is determined technically complete and the Division is prepared to issue final approval, you will be asked to submit two clean copies of the complete and corrected plan. Upon final approval of the permit, the Division will return one copy stamped "approved" for your records.

Please contact me at 801-538-5261, Peter Brinton at 801-538-5258, or Leslie Heppler at 801-538-5257 if you have questions about the review. Thank you for your cooperation in completing this permitting action.

Sincerely,

Paul B. Baker  
Minerals Program Manager

PBB: lah: eb

Attachment: Review

cc: Keith Moeller [keith@cliftonmining.com](mailto:keith@cliftonmining.com)  
BLM – Stephen Allen [blm.gov](mailto:blm.gov)  
DEQ – Mnovak [utah.gov](mailto:utah.gov)

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# REVIEW OF DELETERIOUS MATERIALS CHARACTERIZATION & RELATED INFORMATION

**Desert Hawk Gold Corporation  
Kiewit Project  
M/045/0078  
March 6, 2012**

## Rock Characterization for Deleterious Materials - General Comments

Com ment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
1	General	<p>Based on what is known about the geology, the provided rock characterization data probably correctly characterizes most of the ore and waste for Kiewit mine area as non-sulfide. However, additional information is needed to help determine if and where any sulfide and mixed sulfide/oxide zones exist relative to the pit, because of:</p> <ol style="list-style-type: none"> <li>1) indications by Dumont exploration documents that sulfides have been identified in the Kiewit area,</li> <li>2) at least some Kiewit drill logs that indicate sulfide mineralogy is present reasonably near the pit (below and adjacent), and</li> <li>3) the limited number of samples analyzed (3 per rock type) and the related, weak spacial coverage of the deposit by these samples.</li> </ol> <p>Depending on the findings, a chemical analysis of cuttings from specific intervals of Dumont's reverse circulation (RC) or diamond drill (DD) holes may be needed. The Division needs a map of Dumont's holes to identify pertinent holes and intervals.</p> <p>Depending on the findings, the impacts section (109) may or may not need to be updated.</p>	PNB	
2	General	<p>Please provide a readable map of the locations of RC and DD holes adjacent to and within the Kiewit pit area. Include the location of drillholes in the area of Rodenhouse Wash. Please remove any information you wish to remain confidential.</p>	PNB	
3	General	<p>Please demonstrate to the Division the locations and amount of sulfides within and near the pit boundaries. At least, the Division needs at least to be provided with the elevations (tabulated) at which the drillholes intersect:</p> <ul style="list-style-type: none"> <li>• the elevations of the tops and bottoms of sulfide or mixed sulfide/oxide zones,</li> <li>• the pit boundaries, and</li> <li>• the elevations of any significant water encountered during drilling.</li> </ul> <p>The lengths of the sulfide zones to be used for encapsulation should be identified.</p> <p>If there are more than a few holes with sulfides located within about 50 ft of the 3D pit outline, the Division would prefer a good visual description of some sort (such as a drillhole map with elevations of the pit, intervals with sulfides, any water, etc., listed next to the hole collar, or cross-sections).</p>	PNB	
4	General	<p>Per rule R647 that requires any deleterious or acid forming materials to be identified, please report a justifiable estimate of the volumetric amount of any sulfide and mixed sulfide/oxide material to be mined from the pit, and where in the pit it will be encountered. This may be done by finding the ratios of the identified lengths of sulfide materials relative to the pit depths in the holes. This ratio could be applied to the pit volume to determine a sulfide volume.</p>	PNB	
5	General	<p>Please revise Appendix V to include pertinent information from these tables, and discuss your general and other pertinent conclusions in 106.2, 106.4, etc. Appendix V will need further review based on the material that needs to be added.</p>	PNB	

## R647-4-105 - Maps, Drawings & Photographs

Com ment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
6	NAE Hydrology / Surface Geology Map (from App XIX)	This figure (1"=500') was discussed in a meeting on 2/16/12. This figure should be named Figure 4B, and please include it with the other figures. Pertinent information (e.g. 108.6) from this map should be incorporated into the text.	PNB & LAH	
7	NAE Hydrology / Surface Geology X-Sections (from App XIX)	This figure (1"=200') was viewed in the 2/16/12 meeting. This page with these cross-sections should be identified as Figure 4C, and please include it with the other figures. The general extent to which drill hole data was used in developing these cross-sections should be indicated, or any other source used in developing it.	PNB & LAH	
8	Figure 5 & Figure 7	The locations of the temporary stockpiles are not the same on Figures 5 and 7. Stockpile locations would need to be located so as to not be affected by subsequent pit excavation, and it appears that both locations (Fig 5, Fig 7) lie within the pit boundary. It is understood that these piles are for sulfide material, and as such, should be sized to match a maximum volume of sulfide material to be temporarily stockpiled. Please modify the maps accordingly. Please clarify in the text and on the map if the in-pit location is for the storage of sulphides or ore or for sulphide ore.	PNB & LAH	
9	Figure 5 & Figure 7	Per rule R647-4-110.4, the final location of deleterious material needs to be identified on a map. Please show the footprint of deleterious material encapsulated in waste dumps. Without more information about the percentage of sulfides in the sulfide rock in the area of the pit, it should be assumed that all sulfide material will be deleterious, and the dump sized and displayed accordingly. See 106.4.	PNB	

#### 106.2 - Type of operations conducted, mining method, processing etc.

Com ment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
10	page 8, para. 3	Please revise this paragraph based on future submission of supplemental information and conclusions regarding possible sulfides (see comment above).  Without a map of the Kiewit drill holes, it is uncertain that <u>all</u> of the Kiewit ore is "completely oxidized" or that "there will be no measurable acid generation" from any of the Kiewit material. The quoted text refers to characterization of limited samples that may not be representative of the entire deposit. At least a few of the drill hole logs indicate that zones of sulfide and mixed sulfide/oxide rock types are present in the vicinity of pit boundaries. This will be verifiable with the provided map and logs.	PNB	
11	page 9, para. 3	Restate here the upper limit to the volume of stockpiled material that will be temporarily placed. Please include here the upper limit to the volume of sulfide material that will be placed here. Bond costs will be determined accordingly, since appropriate disposal/reclamation of any deleterious material is required by rule.	PNB	
12	page 10, para 2 / Figure 12B	Identify that ore will be agglomerated. The Tyler 8 mesh is less than 1/10". As discussed, the crushing figure (Figure 12B) indicates that the crushed material will be minus 1/8". Change the text or map to be consistent.	PNB	

#### 106.4 - Nature of materials mined, waste and estimated tonnages

Com ment #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
13	Page 15, para 1 - 2	These paragraphs should be re-evaluated and revised accordingly, based on the conclusions reached about the locations of sulfides.	PNB	

Comment #	Sheet/Page/Map/Table #	Comments	Initials	Review Action
14	Page 15, para 3	Per state rule that requires any deleterious or acid forming materials to be identified, please report the "treatment, location, and disposition" of sulfide materials in or near the pit. Please include the volumetric amount and/or tonnage of sulfide materials to be mined from the pit, where in the pit sulfides will come from, and any locations in the final pit floor or wall that could potentially be acid-forming. Refer to the required map of deleterious material locations upon mine closure (Figures 5 & 7). Volumes may be determined by identifying relative lengths of drill core identified in logs as having sulfides or being mixed sulfide/oxide rock, and applying the ratio to mined material.	PNB	
15	Page 16, para 1	Criteria commonly used to characterize material to be used for encapsulating include having an ANP:AGP ratio of greater than 3. Update this text accordingly. To require a minimum net neutralization potential (NNP) of +20 (units of kgCaCO <sub>3</sub> /tonne?) would be appropriate for rock already meeting the standard ANP:AGP > 3 criteria, but having low overall NNP. Include the units.	PNB	
16	Page 16, para 1	Studies indicate that ore or waste rock could potentially be acid-generating at sulfide levels lower than 5%. It is unclear whether the sulfide material in the area of the pit (as indicated by drillhole logs provided so far) will have sufficient neutralization potential (NP) to justify the disposal of all waste rock in normal waste rock dumps based on their percent sulfides. There is a lot of variation in the NP values from the limited samples, and no NP values are known to be representative of sulfide-bearing rock.  Different methods for categorizing acid generating rock are needed. The results of the requirement to identify sulfides in the pit may require that additional rock characterization to identify NP values of sulfide rock be provided.	PNB	
17	Page 16, para 1	Change the name of Appendix V to reference rock characterization, since "geotechnical" doesn't accurately describe the contents of Appendix V.	PNB	
18	Page 16, para 1	Please include the other basic standard practices for encapsulation of material with potential for acid generation. Please call if you have questions. The waste rock handling plan in Appendix V will need to be updated to reflect standard practices.	PNB	
19	Page 17, para 5	Based on NAE's Hydrology/Surface Geology map (to be named Figure 4B, from Appendix XIX, dated 2/1/2011) and other geology reports, the ore and waste will not be exclusively granodiorite. JP Robinson's geologic report on the Kiewit deposit indicates that granodiorite has been "strongly altered". Refer to the map and any other pertinent resources, and identify other rock types and general mineralogy expected to be found within the pit boundaries.	PNB	
20	Page 17, para 6	Change the 100-hour, 48-year event precipitation amount from 2 inches to be representative of the precipitation at the mine site, as you have with the Storm Water Management Plan calculations (Wendover vs. the site).	PNB	

#### 106.8 - Depth to groundwater, extent of overburden, geology

Comment #	Sheet/Page/Map/Table #	Comments	Initials	Review Action
21	Page 19, para 2	Reference the new Figure 4C (x-sections, Surface Geology/Hydrology) and any of the newly tabulated water elevations from drillholes.	PNB	
22	Page 19, para 2	Published data on the Kiewit deposit (specifically JP Robinson's report on the Kiewit deposit) indicate that significant pre-mineral and also post-mineral faulting and fracturing have occurred in the area. In context of the statement here about the lack of major faults in the area, acknowledgement of this significant faulting and fracturing in the area and any significance to hydrology is needed. Please add to the text.	PNB & LAH	
23	Page 19, para 4	The groundwater information included on page 25 of section 109.1 (apart from projected impacts) should be included here. Please include an approximate groundwater elevation.	PNB	

Comm ent #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
24	Page 19, para 4	Generally summarize the nature of groundwater to be used for process water. Refer here to the Water Resource report.	PNB	
25	Page 19, para 4	The Water Resource Report (p6, V.1.c) indicates that "Ground water is contained in the upper zones of clay sand and gravel." Briefly identify that there will be some amount of alluvial ground water in the area, per Appendix XIX.	PNB	
26	Page 19, para 4	Clarify whether the deeper monitoring hole will be drilled to bedrock regardless of depth, or if the depth will be 250 feet whether bedrock has been contacted or not.	PNB	
27	Page 20, para 3	Identify the presence of sedimentary rock within the pit boundaries, as indicated by the NAE surface geology/hydrology map in App. XIX. Refer to this map (which will be Figure 4B).	PNB	
28	Page 20, para 3	Specify that topsoil will be salvaged from the waste rock dump areas, stockpile areas, and the pit areas prior to mining or placing of mined material in those locations.	PNB	

#### 106.9 – Impact Statement

Comm ent #	Sheet/Page/ Map/Table #	Comments	Initials	Review Action
29	Page 25	Both the groundwater and surface water parts of this section will need to be re-evaluated and revised, based on the information to be provided on the nature of rock with sulfides in the pit and its near vicinity.	PNB	